

We Claim:

1. A device for analyte detection, comprising:
a substrate having a surface thereon;
5 an area of said surface having at least one enhancing structure thereon; and
means for localizing an analyte near said enhancing structure.
2. A device for analyte detection, comprising:
a porous substrate having a surface thereon; and
10 an area having at least one enhancing structure on said surface.
3. The device of Claim 2, wherein said porous substrate has pores sufficiently small to
retain analyte molecules on said surface, and permitting solvent molecules to pass through said
substrate.
15
4. The device of Claim 3, wherein said substrate is within a spin-concentrating device,
said substrate dividing said spin-concentrating device into an upper portion and a lower
portion.
- 20 5. The device of Claim 4, further comprising means for holding said device in a
centrifuge.
6. The device of Claim 4, further comprising means for providing a pressure gradient
from said upper portion of said cylinder to said lower portion of said cylinder.
25
7. A device for detecting a hydrophilic analyte, comprising:
a substrate having a hydrophobic surface thereon; and
an area having at least one hydrophilic enhancing structure on said surface.

8. A device for detecting a hydrophobic analyte, comprising:
a substrate having a hydrophilic surface thereon; and
an area having at least one enhancing structure on said surface, said analyte having
hydrophobicity sufficient to localize said analyte near said at least one enhancing structure.

5

9. A method for detecting an analyte, comprising the steps of:
(a) providing a device comprising:
a substrate having a surface thereon;
an area of said surface having at least one enhancing structure thereon; and
means for localizing an analyte near said enhancing structure;
(b) placing a sample comprising an analyte on said surface;
(c) permitting said analyte to localize near said at least one enhancing structure;
and
(d) detecting the presence of said analyte near said at least one enhancing structure.

10

15

10. A method for detecting an analyte, comprising the steps of:
(a) providing a device comprising:
a substrate having a porous surface having pores therein sufficiently small to
retain analyte molecules on said surface and permitting solvent molecules to pass through; and
an area having at least one enhancing structure on said surface;
(b) applying a sample comprising an analyte on said surface;
(c) moving said solvent through said pores, thereby concentrating said analyte
molecules near said enhancing structures; and
(d) detecting the presence of said analyte near said at least one enhancing structure.

20

25

11. A method for detecting an analyte, comprising the steps of:
(a) providing a device comprising:
a cylinder comprising a substrate having a porous surface having pores therein
sufficiently small to retain analyte molecules on said surface and permitting solvent molecules

to pass through, said substrate dividing said cylinder into an upper portion and a lower portion; and

an area having at least one enhancing structure on said surface;

(b) applying a sample comprising an analyte on said surface;

5 (c) moving said solvent through said pores, thereby concentrating said analyte molecules near said enhancing structures; and

(d) detecting the presence of said analyte near said at least one enhancing structure.

10 12. The method of Claim 11, wherein said step of moving is carried out using a pressure gradient.

13. The method of Claim 12, wherein said pressure gradient is provided by decreasing hydrostatic pressure in said lower portion of said cylinder.

15 14. The method of Claim 12, wherein said pressure gradient is provided by increasing hydrostatic pressure in said upper portion of said cylinder.

15. The method of Claim 11, wherein said step of moving is carried out using a centrifuge.

20 16. A method for detecting a hydrophilic analyte, comprising the steps of:

(a) providing a device comprising:

a substrate having a hydrophobic surface thereon; and

an area having at least one enhancing structure on said surface;

25 (b) applying a sample comprising an analyte on said surface, thereby permitting said analyte to localize near said at least one enhancing structure; and

(c) detecting the presence of said analyte near said at least one enhancing structure.

17. The device of Claim 1, wherein said at least one enhancing structure comprises a fractal particle associate.

18. The device of Claim 17, wherein said fractal particle associate comprises gold or silver particles.

5 19. The device of Claim 2, wherein said at least one enhancing structure is a fractal particle associate.

20. The device of Claim 19, wherein said fractal particle associate comprises gold or silver particles.

10 21. The method of Claim 9, wherein said step of permitting includes permitting solvent evaporation to occur.

22. A device for analyte detection, comprising:
15 a first electrode having at least one enhancing structure thereon, said first electrode within an analysis chamber; and
a second electrode.

23. A method for detecting a charged analyte, comprising the steps of:
20 (a) providing a device comprising:
a first electrode having at least one enhancing structure thereon; and
a second electrode, wherein at least said first electrode is within an analysis chamber;
(b) forming a potential difference between said first and said second electrodes;
(c) applying a sample having a charged analyte therein into said analysis chamber;
25 (d) permitting said charged analyte to localize to said first electrode; and
(e) detecting the presence of said charged analyte near said at least one enhancing structure on said first electrode.

24. The device of Claim 22, wherein said second electrode is within an said analysis chamber and has at least one enhancing structure thereon.

25. A method for detecting an analyte in a mixture of molecules, comprising the steps of:

- 5 (a) providing a substrate having a plurality of enhancing structures thereon;
(b) applying to said substrate an spatial array of molecules containing said analyte;

and

(c) detecting the presence of said analyte near at least one of said plurality of enhancing structures.

10

26. The method of Claim 25, wherein said spatial array is provided by capillary electrophoresis.

27. The method of Claim 25, wherein said spatial array is provided by isoelectric focusing.

15

28. The device of Claim 1, wherein said substrate has a metal layer thereon.

29. The device of Claim 2, wherein said substrate has a metal layer thereon.

20

25